



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/805,435	03/14/2001	Victor I. Klimov	01997-297001	2077

26171 7590 04/08/2003

FISH & RICHARDSON P.C.
1425 K STREET, N.W.
11TH FLOOR
WASHINGTON, DC 20005-3500

EXAMINER

MENEFEE, JAMES A

ART UNIT	PAPER NUMBER
----------	--------------

2828

DATE MAILED: 04/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n No.

09/805,435

Applicant(s)

KLIMOV ET AL.

Examiner

James A. Menefee

Art Unit

2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 January 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-56 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-56 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 9.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Art Unit: 2828

DETAILED ACTION

Response to Amendment

In response to the amendment filed 8 January 2003, claims 40, 45, 51, 52, 55, and 56 are amended. Claims 1-56 are pending.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 4-11 and 14-56 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-31 of U.S. Patent No. 6,322,901 in view of Hakimi et al. (US 5,260,957). Although the conflicting claims are not identical, they are not patentably distinct. '901 is claiming a single nanocrystal, while the present invention is claiming a group of these same nanocrystals that are grouped together, forming a gain medium for use in a laser system. The nanocrystals claimed in '905 exhibit photoluminescence. Hakimi teaches that it is well known that nanocrystals exhibiting photoluminescence, for example quantum dots, are often grouped together into a gain medium and formed into a laser. It would have been obvious to one skilled in the art to make a laser gain

Art Unit: 2828

material out of quantum dots because quantum dot lasers give very good control of the laser emission wavelength, as taught by Hakimi.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 4-5, 9-12, 14-17, 21-25, 28-34, 37-39, 42-44, 47-50, 53-54 are rejected under 35 U.S.C. 102(b) as being anticipated by Hakimi et al. (US 5,260,957). Hakimi discloses the claimed invention as follows:

INDEPENDENT CLAIMS

Regarding claim 1, Hakimi discloses a gain medium 12 comprising a concentrated solid including a plurality of semiconductor nanocrystals 14, wherein the solid is substantially free of defects.

Regarding claims 14 and 23, Hakimi discloses a gain medium 12 comprising a concentrated solid including a plurality of semiconductor nanocrystals 14. It has been held that the recitation that an element is "capable of" performing a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense.

In re Hutchison, 69 USPQ 138.

Art Unit: 2828

Regarding claims 30 and 38, Hakimi discloses laser 10 comprising a gain medium 12 comprising a concentrated solid including a plurality of semiconductor nanocrystals 14. There is a cavity arranged relative to the gain medium to provide feedback.

Regarding claim 43, Hakimi discloses laser 10 comprising a gain medium 12 comprising a concentrated solid including a plurality of semiconductor nanocrystals 14. There is a cavity arranged relative to the gain medium to provide feedback. The solid inherently provides gain to an optical signal at an energy equal to or less than the band gap emission of the nanocrystals, because the nanocrystals are providing the gain.

Regarding claim 48, the limitations are disclosed as in the rejection of claims 23 and 43 above.

Regarding claim 49, the claim is the method of normal operation of the device of claim 43, and therefore the limitations are inherently met through the normal operation of that device.

Regarding claim 53, the claim is the method of normal operation of the device of claim 30, and therefore the limitations are inherently met through the normal operation of that device.

DEPENDENT CLAIMS

Regarding claims 4-5, 16-17, 24-25, 34, 39, 44, 50, and 54, the nanocrystals are made of materials such as CdSe or ZnTe (col. 2 lines 7-10).

Regarding claims 9, 21, and 28, each nanocrystal has a diameter less than 10 nm (col. 2 lines 46-47).

Regarding claims 10-11, 22, 29, 37, 42, and 47, the nanocrystals may have a monodisperse distribution of sizes (col. 1 line 65 – col. 2 line 11).

Art Unit: 2828

Regarding claim 12, the gain medium may be provided on a substrate (col. 3 lines 55-64).

Regarding claim 15, the limitation is not given weight, as in independent claim 14 above.

Regarding claims 31-33, the solid is substantially free of defects, and there is an optical excitation source 20.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-3 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hakimi. Hakimi discloses the limitations of the claims as shown above, but does not disclose the following:

Regarding claims 2-3, it is not disclosed that the solid contains greater than 10% by volume of nanocrystals. However, it is well known that the concentration of quantum wells of a solid gain material will affect the amount of gain provided when it is optically pumped. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the solid this specific width, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 13, it is not disclosed that the substrate be made of glass, or that the thickness of the solid of nanocrystals be greater than about 0.2 microns. It is well known that gain media may be formed on glass substrates. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the substrate of glass, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416. It is well known that the width of a solid gain material will affect the amount of gain provided when it is optically pumped. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the solid this specific width, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Response to Arguments

Applicant's arguments filed 8 January 2003 have been fully considered but they are not persuasive. Applicant argues that neither the '901 reference nor Hakimi discloses a concentrated solid including a plurality of semiconductor nanocrystals. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., that a concentrated solid including a plurality of semiconductor nanocrystals is defined as a group of nanocrystals on a substrate that is greater than the critical volume fraction required for stimulated emission) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26

USPQ2d 1057 (Fed. Cir. 1993). The gain medium of Hakimi is a host material having a number of nanocrystals (the quantum dots) disposed therein, with the number of nanocrystals inherently being above an amount than the critical volume for stimulated emission because the host material having the nanocrystals is capable of laser emission. Thus, such a material can be interpreted as a concentrated solid including a plurality of semiconductor nanocrystals.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Menefee whose telephone number is (703) 605-4367. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone numbers for the

Application/Control Number: 09/805,435


Page 8

Art Unit: 2828

organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JM
March 26, 2003


PAUL IP
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800